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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/852,899	05/10/2001	Alvin P. Short	01 P 08366 US (8055-25)	5432

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EXAMINER

MAI, ANH D

ART UNIT PAPER NUMBER

2814

DATE MAILED: 06/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application N .

09/852,899

Applicant(s)

SHORT, ALVIN P.

Examiner

Anh D. Mai

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-6 and 18-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 18-23 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Status of the Claims*

1. Amendment filed June 10, 2003 has been entered as Paper No. 12. Claim 1 have been amended. Claims 18-23 have been added. Claims 1-6 and 18-23 are pending.

### *Claim Objections*

2. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered claims 7-12 have been renumbered 18-23.

### *Response to Amendment*

3. The amendment filed June 10, 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: “wherein the first conductive material comprises **a pillar** extending from a bottom of the trench, wherein the first conductive material **contacts the buried plate** along an entire bottom portion of trench and **along a lower portion of the sidewalls of the trench**”.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 1-6 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

There does not appear to be a written description of the claim limitation “wherein the first conductive material comprises **a pillar** extending from a bottom of the trench, wherein the first conductive material **contacts the buried plate** along an entire bottom portion of trench and **along a lower portion of the sidewalls of the trench**” in the application as filed.

Note that, a pillar (Fig. 9, page 12, lines 2-10) only contacts the buried plate at the bottom of the trench.

As best understood by the examiner, a pillar of the first conductive material extends from the bottom of the trench and contacts the buried plate at the bottom.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 2 is further rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites: “wherein the first conductive material is formed into a plurality of pillars extending from the bottom of the trench”.

Claim 1, however, recites “**a pillar**”. Therefore, claim 2 is indefinite because “a pillar” can not be “a plurality of pillars”.

***Claim Rejections - 35 USC § 102***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-4, 6, 18-21 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Park (U.S. Patent No. 5,677,225) of record.

With respect to claim 1, as best understood by the examiner, Park teaches a semiconductor device as claimed including:

a trench formed in a substrate (21):

a diffusion region (23) surrounding the trench to form a buried plate (23);

a first conductive material (26') formed in the trench, wherein the first conductor material (26') comprises a pillar (26') extending from a bottom of the trench, wherein the first conductive material (26') contacts the buried plate along the bottom portion of the trench, and wherein the first conductor material (26') and the buried plate form a first electrode;

a second conductive material (33) disposed in the trench to form a second electrode (33);  
(33); and

a node dielectric layer (28) formed between the first electrode (26'/23) and the second electrode (33). (See Fig. 2E).

With respect to claim 18, Park teaches a semiconductor device as claimed including:

a trench formed in a substrate (21):

a diffusion region (23) surrounding the trench to form a buried plate (23);

a first conductive material (26') formed in the trench, wherein the first conductor material (26') comprises a pillar extending from a bottom of the trench, wherein the first conductor material (26') and the buried plate form a first electrode;

a second conductive material (33) disposed in the trench to form a second electrode (33);  
(33); and

a node dielectric layer (28) formed between the first electrode (26'/23) and the second electrode (33). (See Fig. 2E).

With respect to claims 2 and 19, the first conductive material (26') of Park is formed into a plurality of pillars extending from the bottom of the trench.

With respect to claims 3 and 20, the plurality of pillars (26') of Park includes the second conductive material (33) disposed between the plurality of pillars (26').

With respect to claims 4 and 21, the first conductive material (26) of Park includes one of the material as claimed.

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With respect to claims 6 and 23, the second conductive material (29) of Park is disposed between the first conductive material (26) and the buried plate (23).

***Claim Rejections - 35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claims 5 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park '225 as applied to claims 1 and 18 above, and further in view of Chang (U.S. Patent No. 6,077,739) of record.

Park teaches a semiconductor device includes a doped second conductive material (33).

Thus, Park is shown to teach all the features of the claim with the exception of explicitly using amorphous silicon.

However, Chang teaches a second conductive material (32) is formed of amorphous silicon.

Therefore, it would have been obvious to one having ordinary skill in the art at the time of invention to form the second conductive material (33) of Park using amorphous silicon as taught by Chang since amorphous silicon can be deposited at a lower temperature.

***Response to Arguments***

8. Applicant's arguments with respect to all claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anh D. Mai whose telephone number is (703) 305-0575. The examiner can normally be reached on 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (703) 308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.




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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A.M

June 20, 2003



LONG PHAM  
PRIMARY EXAMINER